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Report on the technical review of the seventh national communication of Lithuania

Parties included in Annex I to the Convention were requested by decision 9/CP.16 to submit their seventh national communication to the secretariat by 1 January 2018. According to decision 15/CMP.1, Parties included in Annex I to the Convention that are also Parties to the Kyoto Protocol are required to include in their national communications supplementary information under Article 7, paragraph 2, of the Kyoto Protocol. This report presents the results of the technical review of the seventh national communication and relevant supplementary information under the Kyoto Protocol of Lithuania, conducted by an expert review team in accordance with the "Guidelines for the technical review of information reported under the Convention related to greenhouse gas inventories, biennial reports and national communications by Parties included in Annex I to the Convention" and the "Guidelines for review under Article 8 of the Kyoto Protocol".

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Abbreviations and acronyms

AEA	annual emission allocation
Annex II Party	Party included in Annex II to the Convention
AR4	Fourth Assessment Report of the Intergovernmental Panel on Climate Change
BR	biennial report
CH_4	methane
CO_2	carbon dioxide
CO_2 eq	carbon dioxide equivalent
CTF	common tabular format
ERT	expert review team
ESD	effort-sharing decision
EU	European Union
EU ETS	European Union Emissions Trading System
F-gas	fluorinated gas
GCOS	Global Climate Observing System
GDP	gross domestic product
GHG	greenhouse gas
HFC	hydrofluorocarbon
IPCC	Intergovernmental Panel on Climate Change
IPPU	industrial processes and product use
LULUCF	land use, land-use change and forestry
NA	not applicable
NC	national communication
NEIS	National Energy Independence Strategy
NF_3	nitrogen trifluoride
NGO	non-governmental organization
NIR	national inventory report
NO	not occurring
N_2O	nitrous oxide
non-ETS sectors	sectors not covered by the EU ETS
PaMs	policies and measures
PFC	perfluorocarbon
RCP	representative concentration pathway
reporting guidelines for supplementary information	"Guidelines for the preparation of the information required under Article 7 of the Kyoto Protocol, Part II: Reporting of supplementary information under Article 7, paragraph 2"
RES	renewable energy sources
SF_6	sulfur hexafluoride
UNFCCC reporting guidelines on NCs	"Guidelines for the preparation of national communications by Parties included in Annex I to the Convention, Part II: UNFCCC reporting guidelines on national communications"
WAM	'with additional measures'
WEM	'with measures'
WOM	'without measures'

I. Introduction and summary

A. Introduction

1. This is a report on the centralized technical review of the NC7 of Lithuania. The review was coordinated by the secretariat in accordance with the "Guidelines for the technical review of information reported under the Convention related to greenhouse gas inventories, biennial reports and national communications by Parties included in Annex I to the Convention", particularly "Part V: UNFCCC guidelines for the technical review of national communications from Parties included in Annex I to the Convention" (annex to decision 13/CP.20), and the "Guidelines for review under Article 8 of the Kyoto Protocol" (annex to decision 22/CMP.1 and annex I to decision 4/CMP.11).[1]

2. In accordance with the same decisions, a draft version of this report was transmitted to the Government of Lithuania, which provided comments that were considered and incorporated, as appropriate, into this final version of the report.

3. The review was conducted from 12 to 17 March 2018 in Bonn by the following team of nominated experts from the UNFCCC roster of experts: Ms. Asia Adlan (Sudan), Mr. Menouer Boughedaoui (Algeria), Mr. Christo Christov (Bulgaria), Ms. Nancy Liliana Gamba Cabezas (Colombia), Mr. Domenico Gaudioso (Italy), Mr. Liviu Gheorghe (Romania), Mr. Dirk Günther (Germany), Ms. Fui Pin Koh (Malaysia), Ms. Sangchan Limjirakan (Thailand), Mr. Juan Luis Martin Ortega (Spain), Mr. Engin Mert (Turkey), Ms. Gherghita Nicodim (Romania), Mr. Koki Okawa (Japan), Ms. Marcela Itzel Olguin-Alvarez (Mexico), Mr. Brian Quirke (Ireland), Ms. Kristina Saarinen (Finland), Ms. Marina Shvangiradze (Georgia) and Ms. Caroline Tagwireyi (Zimbabwe). Mr. Gaudioso, Ms. Saarinen and Ms. Shvangiradze were the lead reviewers. The review was coordinated by Ms. Veronica Colerio, Ms. Suvi Monni and Ms. Sevdalina Todorova (UNFCCC secretariat).

B. Summary

4. The ERT conducted a technical review of the information reported in the NC7 of Lithuania in accordance with the UNFCCC reporting guidelines on NCs (decision 4/CP.5) and the reporting guidelines for supplementary information, in particular the supplementary information required under Article 7, paragraph 2, and on the minimization of adverse impacts under Article 3, paragraph 14, of the Kyoto Protocol (annex to decision 15/CMP.1 and annex III to decision 3/CMP.11).

1. Timeliness

5. The NC7 was submitted on 29 December 2017, before the deadline of 1 January 2018 mandated by decision 9/CP.16.

2. Completeness, transparency of reporting and adherence to the reporting guidelines

6. Issues and gaps identified by the ERT related to the reported information are presented in table 1. The information reported by Lithuania in its NC7, including the supplementary information under the Kyoto Protocol, mostly adheres to the UNFCCC reporting guidelines on NCs.

[1] At the time of the publication of this report, the Party had submitted its instrument of acceptance of the Doha Amendment; however, the amendment had not yet entered into force. The implementation of the provisions of the Doha Amendment is therefore considered in this report in the context of decision 1/CMP.8, paragraph 6, pending the entry into force of the amendment.

Table 1

Assessment of completeness and transparency of mandatory information reported by Lithuania in its seventh national communication, including supplementary information under the Kyoto Protocol

Section of NC	*Completeness*	*Transparency*	*Reference to description of recommendations*	*Supplementary information under the Kyoto Protocol*	*Completeness*	*Transparency*	*Reference to description of recommendations*
Executive summary	Complete	Transparent		National system	Complete	Transparent	
National circumstances	Complete	Transparent		National registry	Complete	Transparent	
GHG inventory	Complete	Transparent		Supplementarity relating to the mechanisms pursuant to Articles 6, 12 and 17	Complete	Transparent	
PaMs	Complete	Mostly transparent	Issue 2 in table 7	PaMs in accordance with Article 2	Complete	Transparent	
Projections and the total effect of PaMs	Mostly complete	Mostly transparent	Issues 2 and 5 in table 11 Issues 1 and 3 in table 13	Domestic and regional programmes and/or arrangements and procedures	Complete	Mostly transparent	Issue 1 in table 5
Vulnerability assessment, climate change impacts and adaptation measures	Complete	Transparent		Information under Article 10[a]	NA	NA	NA
Financial resources and transfer of technology[b]	NA	NA	NA	Financial resources[c]	NA	NA	NA
Research and systematic observation	Complete	Transparent		Minimization of adverse impacts in accordance with Article 3, paragraph 14	Complete	Transparent	
Education, training and public awareness	Complete	Transparent					

Note: A list of recommendations pertaining to the completeness and transparency issues identified in this table is included in chapter III below.

[a] The assessment refers to information provided by the Party on the provisions contained in Article 4, paragraphs 3, 5 and 7, of the Convention reported under Article 10 of the Kyoto Protocol, which is relevant to Annex II Parties only. Assessment of the information provided by the Party on the other provisions of Article 10 of the Kyoto Protocol is provided under the relevant substantive headings under the Convention, for example research and systematic observation.

[b] Lithuania is not an Annex II Party and is therefore not obliged to adopt measures and fulfil obligations defined in Article 4, paragraphs 3, 4 and 5, of the Convention.

[c] Lithuania is not an Annex II Party and is therefore not obliged to provide information on financial resources under Article 11 of the Kyoto Protocol, including on "new and additional" resources.

3. Summary of reviewed supplementary information under the Kyoto Protocol

7. The supplementary information under Article 7, paragraph 2, of the Kyoto Protocol is incorporated in different sections of the NC7, and the supplementary information under Article 7, paragraph 1, of the Kyoto Protocol is reported in the NIR of the 2017 annual submission. Table 2 provides references to where the information is reported. The technical assessment of the information reported under Article 7, paragraphs 1 and 2, of the Kyoto Protocol is contained in the relevant sections of this report.

Table 2
Overview of supplementary information under the Kyoto Protocol reported by Lithuania

Supplementary information	*Reference to section of the NC7*
National registry	3.3
National system	3.2
Supplementarity relating to the mechanisms pursuant to Articles 6, 12 and 17	5.4
PaMs in accordance with Article 2	4 and 7
Domestic and regional programmes and/or legislative arrangements and enforcement and administrative procedures	3.2, 3.3, 4.1, 4.2 and 4.11
Information under Article 10	3.2, 3.3, 4, 6.2, 6.3 and 7–9
Financial resources[a]	NA
Minimization of adverse impacts in accordance with Article 3, paragraph 14	Reported in the NIR of the Party's 2017 annual submission

[a] Reporting on financial resources under the Kyoto Protocol is relevant to Annex II Parties. As Lithuania is not an Annex II Party, it does not have an obligation to provide information on financial resources under Article 11 of the Kyoto Protocol, including on "new and additional" resources.

II. Technical review of the information reported in the seventh national communication, including the supplementary information under the Kyoto Protocol

A. Information on national circumstances and greenhouse gas emissions and removals

1. National circumstances relevant to greenhouse gas emissions and removals

(a) Technical assessment of the reported information

8. The national circumstances of Lithuania explain the relationship between its historic and future emission trends and the climate change policy agenda. The changing nature of those circumstances defines the factors that affect the climate policy development and implementation of the Convention. The NC7 contains key data on legislation, population trends, geography and land use, climate and climate change, economic developments, energy, transport, the buildings sector, industry, trade, the services sector, agriculture, forestry and waste. The main economic activity in Lithuania is the services sector, followed by industry and construction. Over the past two decades, the country has experienced significant growth, caused by the introduction of the market economy in the country and accession to the EU in 2004. From 1990 to 2016 the total primary energy consumption in Lithuania decreased by almost 55 per cent. Currently, natural gas is the most important fuel in the Lithuanian primary energy balance, replacing oil and oil products. In the period 1990–2016, the contribution of RES to the primary energy supply increased by 4.6 times, with an average annual growth of 6 per cent, with solid biomass being the most important domestic energy source, followed by wind. In the industrial sector, manufacturing represents 90 per cent of total industrial production (excluding construction). The

agriculture sector has a great influence in the development of Lithuanian rural areas, because 33 per cent of the residents live in the countryside. The transport sector is one of the most promising sectors of the national economy, because of the central location of the country between Western Europe, the Nordic countries and the eastern markets of the Russian Federation and the Commonwealth of Independent States.

9. The ERT noted that during the period 1990–2015 Lithuania's population decreased by 21.4 per cent, whereas GDP increased by 64.8 per cent; GHG emissions per GDP unit and GHG emissions per capita decreased by 74.6 and 46.7 per cent, respectively. The ERT noted a significant decoupling of total GHG emissions from economic growth. Table 3 illustrates the national circumstances of Lithuania by providing some indicators relevant to emissions and removals.

Table 3
Indicators relevant to greenhouse gas emissions and removals for Lithuania for the period 1990–2015

						Change (%)	
Indicators	*1990*	*2000*	*2010*	*2014*	*2015*	*1990–2015*	*2014–2015*
GDP per capita (thousands 2011 USD using purchasing power parity)	12.26	11.62	20.09	25.02	25.71	109.7	2.7
GHG emissions without LULUCF per capita (t CO_2 eq)	12.99	5.60	6.71	6.78	6.92	–46.7	2.1
GHG emissions without LULUCF per GDP unit (kg CO_2 eq per 2011 USD using purchasing power parity)	1.06	0.48	0.33	0.27	0.27	–74.6	–0.6

Sources: (1) GHG emission data: Lithuania's 2017 GHG inventory submission, version 4; (2) population and GDP: World Bank.

Note: The ratios per capita and per GDP unit are calculated relative to GHG emissions without LULUCF; the ratios are calculated using the exact (not rounded) values and may therefore differ from a ratio calculated with the rounded numbers provided in the table.

(b) Assessment of adherence to the reporting guidelines

10. The ERT assessed the information reported in the NC7 of Lithuania and recognized that the reporting is complete, transparent and adhering to the UNFCCC reporting guidelines on NCs. There were no issues raised during the review relating to the topics discussed in this chapter of the review report.

2. Information on greenhouse gas emissions and removals

(a) Technical assessment of the reported information

11. Total GHG emissions[2] excluding emissions and removals from LULUCF decreased by 58.2 per cent between 1990 and 2015, whereas total GHG emissions including net emissions or removals from LULUCF decreased by 69.9 per cent over the same period. Table 4 illustrates the emission trends by sector and by gas for Lithuania.

[2] In this report, the term "total GHG emissions" refers to the aggregated national GHG emissions expressed in terms of CO_2 eq excluding LULUCF, unless otherwise specified. Values in this paragraph are calculated based on the 2017 annual submission, version 4.

Table 4
Greenhouse gas emissions by sector and by gas for Lithuania for the period 1990–2015

	GHG emissions (kt CO_2 eq)					*Change (%)*		*Share (%)*	
	1990	*2000*	*2010*	*2014*	*2015*	*1990–2015*	*2014–2015*	*1990*	*2015*
Sector									
1. Energy	33 107.67	10 808.18	12 874.68	11 049.58	11 057.09	–66.6	0.1	68.9	55.0
A1. Energy industries	13 552.63	5 055.97	5 329.59	3 167.59	3 155.10	–76.7	–0.4	28.2	15.7
A2. Manufacturing industries and construction	6 164.93	1 091.49	1 290.66	1 309.09	1 187.30	–80.7	–9.3	12.8	5.9
A3. Transport	5 835.06	3 206.20	4 418.65	4 857.19	5 113.75	–12.4	5.3	12.1	25.4
A4. and A5. Other	7 289.26	1 242.45	1 589.52	1 429.38	1 302.47	–82.1	–8.9	15.2	6.5
B. Fugitive emissions from fuels	265.78	212.07	246.27	286.32	298.48	12.3	4.2	0.6	1.5
C. CO_2 transport and storage	NO	NO	NO	NO	NO	NA	NA	NA	NA
2. IPPU	4 502.71	3 094.39	2 239.19	3 176.87	3 396.58	–24.6	6.9	9.4	16.9
3. Agriculture	8 853.48	4 156.97	4 329.22	4 529.73	4 600.30	–48.0	1.6	18.4	22.9
4. LULUCF	–3 511.89	–9 820.50	–9 901.15	–7 331.99	–6 705.03	90.9	–8.6	NA	NA
5. Waste	1 576.72	1 540.77	1 339.40	1 112.96	1 042.25	–33.9	–6.4	3.3	5.2
6. Other	NO	NO	NO	NO	NO	NA	NA	NA	NA
Gas[a]									
CO_2	35 807.13	11 806.06	13 712.65	12 874.38	13 141.77	–63.3	2.1	74.5	65.4
CH_4	6 953.76	3 840.26	3 660.82	3 432.90	3 376.34	–51.4	–1.6	14.5	16.8
N_2O	5 279.69	3 931.20	3 143.50	3 106.10	3 093.94	–41.4	–0.4	11.0	15.4
HFCs	NO	22.08	259.52	449.48	478.36	NA	6.4	NA	2.4
PFCs	NO	NO	NO	NO	NO	NA	NA	NA	NA
SF_6	NO	0.72	5.99	5.98	5.54	NA	–7.2	NA	0.0
NF_3	NO	NO	NO	0.29	0.26	NA	–11.7	NA	0.0
Total GHG emissions without LULUCF	**48 040.58**	**19 600.32**	**20 782.48**	**19 869.14**	**20 096.21**	**–58.2**	**1.1**	**100.0**	**100.0**
Total GHG emissions with LULUCF	**44 528.69**	**9 779.82**	**10 881.33**	**12 537.14**	**13 391.18**	**–69.9**	**6.8**	**NA**	**NA**

Source: GHG emission data: Lithuania's 2017 annual submission, version 4.
[a] Emissions by gas without LULUCF and without indirect CO_2.

12. The decrease in total GHG emissions occurred mainly in the early 1990s and was mainly driven by the transition to a market-based economy by restructuring manufacturing industries, energy industries and agriculture.

13. The energy sector is the most significant source of GHG emissions in Lithuania, accounting for 55.0 per cent of total emissions (excluding LULUCF) in 2015. This is followed by the agriculture (22.9 per cent), IPPU (16.9 per cent) and waste (5.2 per cent) sectors.

14. Between 1990 and 2015, GHG emissions from the energy sector decreased by 66.6 per cent (22,050.58 kt CO_2 eq), owing mainly to the economic decline in the early 1990s. There have been significant changes in the use of oil products, influenced by decreasing consumption of heavy oil products for electricity production and district heating and a growing consumption of fuel in the transport sector. The Party reports in its NC7 that the closure of the Ignalina nuclear power plant in 2010 and the increase in GDP had an impact on GHG emissions from the energy sector, with an increase by 8 per cent in 2010 compared with 2009. The contribution of RES to Lithuania's primary energy balance has increased

steadily (6 per cent average annual growth between 1990 and 2016). The contribution of emissions from transport to the total emissions from the energy sector significantly increased from 1990 to 2015 (from 17.6 per cent to 46.2 per cent). Although the energy profile changed significantly during this period, there has been an overall increase in emissions from transport since 2000 influenced by the increased density of transport routes and the number of road vehicles.

15. Between 1990 and 2015, GHG emissions from the IPPU sector decreased by 24.6 per cent (1,106.13 kt CO_2 eq). The chemical industry (ammonia and nitric acid production) has been a key driver in influencing trends in emissions from the IPPU sector, with emissions peaking in 2007. Between 1990 and 2015, GHG emissions from the agriculture sector decreased by 48.0 per cent (4,253.18 kt CO_2 eq), owing mainly to significant reforms in the early 1990s. Agriculture is the most significant source of CH_4 and N_2O emissions. The reduction of CH_4 emissions has been mostly influenced by a decrease in livestock population. The LULUCF sector was a net sink of 6,705.03 kt CO_2 eq in Lithuania in 2015; net GHG removals have increased by 3,193.14 kt CO_2 eq since 1990. The trend was mainly driven by afforestation and reforestation. Despite the overall increase in removals, the LULUCF sector was a net source in 1996 and 1997 because of significant losses in trees caused by sudden spruce dieback. Between 1990 and 2015, GHG emissions from the waste sector decreased by 33.9 per cent (534.47 kt CO_2 eq). Solid waste disposal is the largest source of emissions in the waste sector. There has been a decrease in emissions since 2003 owing to a reduction in the amount of disposed waste, recovery of landfill gas and anaerobic digestion of sewage sludge.

16. As shown in table 4, CO_2 is the most important GHG, accounting for 65.4 per cent of total GHG emissions (excluding LULUCF) in 2015. Emissions decreased by 63.3 per cent between 1990 and 2015. CO_2 emissions increased by 2.1 per cent between 2014 and 2015. The energy sector (including transport) is the main source of CO_2 emissions, accounting for 79.3 per cent of CO_2 emissions in 2015 (excluding LULUCF). CH_4 is the second most important GHG, accounting for 16.8 per cent of total GHG emissions in 2015 (excluding LULUCF). CH_4 emissions decreased by 51.4 per cent between 1990 and 2015. Agriculture is the main source of CH_4 emissions and contributed 56.4 per cent of total CH_4 emissions in 2015 (excluding LULUCF). N_2O emissions accounted for 15.4 per cent of total GHG emissions in 2015 (excluding LULUCF) and decreased by 41.4 per cent between 1990 and 2015. The largest source of N_2O emissions is agriculture, contributing 85.1 per cent in 2015. F-gases accounted for 2.4 per cent of total GHG emissions in 2015 (excluding LULUCF).

17. The summary information provided on GHG emissions was consistent with the information reported in the 2017 annual submission.

(b) Assessment of adherence to the reporting guidelines

18. The ERT assessed the information reported in the NC7 of Lithuania and recognized that the reporting is complete, transparent and adhering to the UNFCCC reporting guidelines on NCs. No issues relating to the topics discussed in this chapter of the review report were raised during the review.

3. National system for the estimation of anthropogenic emissions by sources and removals by sinks

(a) Technical assessment of the reported information

19. Lithuania provided in the NC7 a description of how its national system for the estimation of anthropogenic emissions by sources and removals by sinks of all GHGs not controlled by the Montreal Protocol is performing the general and specific functions defined in the annex to decision 19/CMP.1. The description includes all the elements mandated by paragraph 30 of the annex to decision 15/CMP.1. The NC7 also contains a reference to the description of the national system provided in the NIR of the 2017 annual submission. The ERT took note of the review of the changes to the national system reflected in the report on the individual review of the 2016 annual submission of Lithuania.

(b) Assessment of adherence to the reporting guidelines

20. The ERT assessed the information reported in the NC7 of Lithuania and recognized that the reporting is complete and transparent. No issues relating to the topics discussed in this chapter of the review report were raised during the review.

4. National registry

(a) Technical assessment of the reported information

21. In the NC7 Lithuania provided information on how its national registry performs the functions in accordance with the annex to decision 13/CMP.1 and the annex to decision 5/CMP.1 and complies with the requirements of the technical standards for data exchange between registry systems. The ERT took note of the review of the changes to the national registry reflected in the report on the individual review of the 2016 annual submission of Lithuania.

(b) Assessment of adherence to the reporting guidelines

22. The ERT assessed the information reported in the NC7 of Lithuania and recognized that the reporting is complete and transparent. No issues relating to the topics discussed in this chapter of the review report were raised during the review.

B. Information on policies and measures and institutional arrangements

1. Domestic and regional programmes and/or legislative arrangements and procedures related to the Kyoto Protocol

(a) Technical assessment of the reported information

23. For the second commitment period of the Kyoto Protocol, from 2013 to 2020, Lithuania committed to contributing to the joint EU effort to reduce GHG emissions by 20 per cent below the base-year level. The National Strategy for Climate Change Management Policy, approved by the Parliament, lays down the targets and objectives for climate change mitigation and adaptation by 2050. The strategy implements the EU legal acts of the 2020 climate and energy package and replaces the National Strategy for the Implementation of the UNFCCC until 2012. The strategy sets the short-term (until 2020), indicative midterm (until 2030 and 2040) and long-term (until 2050) goals and objectives for climate change mitigation and adaptation. The strategy also lays down indicative medium-term climate change mitigation targets outlining how Lithuania will contribute towards the implementation of the EU GHG emission reduction targets of reducing GHG emissions by 40 per cent by 2030 and by 60 per cent by 2040. The indicative long-term target of the strategy is to reduce GHG emissions by 80 per cent by 2050 compared with the 1990 level.

24. The overall responsibility for climate change policymaking lies with the Ministry of Environment, and a number of national institutions are involved in the implementation of the policy. The Ministry of Environment also has overall responsibility for reporting on PaMs and projections on the basis of sectoral information sent through questionnaires by responsible ministries and data providers. The Environmental Protection Agency is responsible for the preparation of GHG projections based on activity data received from data providers, in particular for the energy, industrial processes, agriculture and waste sectors. The State Forest Service is responsible for the preparation of projections for the LULUCF sector.

25. Lithuania has legislative arrangements and administrative procedures in place to make information publicly accessible, including publication of the information on the administrative structure for the implementation of the Kyoto Protocol, as well as legal acts, reports and information on the same issue, on the official website of the Ministry of Environment, under the heading "Climate change".

26. Lithuania has national legislative arrangements and administrative procedures in place that seek to ensure that the implementation of activities under Article 3, paragraph 3,

forest management under Article 3, paragraph 4, and any elected activities under Article 3, paragraph 4, of the Kyoto Protocol also contributes to the conservation of biodiversity and the sustainable use of natural resources. The National Forest Area Development Programme 2012–2020 aims to: increase the forest coverage of the country up to 34.2 per cent by 2020 through the afforestation of abandoned lands and lands that are not suitable for agricultural activities; encourage people through financial measures to plant forests on private and State-owned lands; and develop forest regeneration on a genetic-ecological basis.

(b) Assessment of adherence to the reporting guidelines

27. The ERT assessed the information reported in the NC7 of Lithuania and identified an issue relating to transparency. The finding is described in table 5.

Table 5
Findings on domestic and regional programmes and/or legislative arrangements and procedures related to the Kyoto Protocol from the review of the seventh national communication of Lithuania

No.	*Reporting requirement, issue type and assessment*	*Description of the finding with recommendation*
1	Reporting requirement specified in paragraph 37 Issue type: transparency Assessment: recommendation	Lithuania included in chapters 4 and 9 of its NC7 a reference to publicly accessible information on legal acts in general. For example, in section 4.2 of the NC7 Lithuania explained that the right of access to information in official documents is a basic civil right protected by the Lithuanian Constitution and that legal acts are available on the websites of the Parliament and the Ministry of Environment, which also include reports and information related to climate change. The ERT noted that the information provided does not include a description of the underlying provisions to make the information on the legislative arrangements and enforcement and administrative procedures established pursuant to the implementation of the Kyoto Protocol publicly accessible. In response to a question raised during the review, Lithuania provided additional information, including that Article 17 of the Legislative Framework law establishes the requirement to publish all draft legal acts in the Legislative Information System, and approved legal acts in the Electronic Legislation Register, which are publicly available. Information on the administrative structure of the implementation of the provisions of the Kyoto Protocol and other international climate agreements (including projects and studies carried out, events organized) are published on the official website of the Ministry of Environment, under the heading "Climate change". The ERT recommends that Lithuania improve the transparency of its submission by including information on the existing provisions to make information on the legislative arrangements and enforcement and the administrative procedures established pursuant to the implementation of the Kyoto Protocol publicly accessible, in line with the information provided during the review.

Note: Paragraph number listed under reporting requirement refers to the relevant paragraph of the reporting guidelines for supplementary information. The reporting on the requirements not included in this table is considered to be complete and transparent.

2. Policies and measures, including those in accordance with Article 2 of the Kyoto Protocol

(a) Technical assessment of the reported information

28. Lithuania provided information on its package of PaMs implemented, adopted and planned, by sector and by gas, in order to fulfil its commitments under the Convention and its Kyoto Protocol. The Party reported on its policy context and legal and institutional arrangements put in place to implement its commitments and monitor and evaluate the effectiveness of its PaMs.

29. Lithuania provided information on a set of PaMs similar to those previously reported, except those that are new or revised, such as its NEIS (from 2012, with a revision currently under preparation), the National Renewable Energy Resources Programme for

2016–2020, the Programme on Heat Industry Development in 2015–2021 and the National Water Area Development Programme 2017–2023.

30. Lithuania gave priority to implementing the PaMs that make the most significant contribution to its emission reduction efforts. The Party provided information on how it believes its PaMs are modifying longer-term trends in anthropogenic GHG emissions and removals in accordance with the objective of the Convention. For example, the Party reported that the revised NEIS sets targets for the amount of RES in gross final energy consumption of 45 per cent by 2030 and 80 per cent by 2050 and energy efficiency targets to reduce primary and final energy intensity by 1.5 times by 2030 and 2.4 times by 2050 compared with the 2017 level. According to a study carried out in 2015, implementing the EU 2030 climate and energy policies would reduce Lithuania's GHG emissions by 1,382.7 kt CO_2 eq in the period 2021–2030. Lithuania reported on the PaMs that have been discontinued since the previous submission. During the review, Lithuania reported on how it periodically updates its PaMs to reduce emissions by a greater level.

31. Some PaMs are deferred to the local level. In its NC7 Lithuania reported, inter alia, on the voluntary emission reduction targets that local authorities have committed to. Lithuania reported that 14 Lithuanian municipalities have joined the Covenant of Mayors. They are committed to reduce by 2020 GHG emissions in their local areas by 47.5 per cent compared with the 1990 level.

32. Under the Convention Lithuania committed to contributing to the achievement of the joint EU economy-wide emission reduction target of 20 per cent below the 1990 level by 2020. The EU offered to move to a 30 per cent reduction target on the condition that other developed countries commit to a comparable target and developing countries contribute according to their responsibilities and respective capabilities under a new global climate change agreement.

33. The key overarching cross-sectoral policy in the EU is the 2020 climate and energy package, adopted in 2009, which includes the revised EU ETS and the ESD. The package is supplemented by renewable energy and energy efficiency legislation and legislative proposals on the 2020 targets for CO_2 emissions from cars and vans, the carbon capture and storage directive, and the general programmes for environmental conservation, namely the 7th Environment Action Programme and the clean air policy package.

34. In operation since 2005, the EU ETS is a cap-and-trade system that covers all significant energy-intensive installations (mainly large point emissions sources such as power plants and industrial facilities) that produce 40–45 per cent of the GHG emissions of the EU. It is expected that the EU ETS will guarantee that the 2020 target (a 21 per cent emission reduction below the 2005 level) will be achieved for sectors under the scheme. The third phase of the EU ETS started in 2013 and the system now includes aircraft operations (since 2012) as well as N_2O emissions from chemical industries, PFC emissions from aluminium production and CO_2 emissions from some industrial processes (since 2013) that were not covered in the earlier phases of the EU ETS.

35. The ESD became operational in 2013 and covers sectors outside the EU ETS, including transport (excluding domestic and international aviation, and international maritime transport), residential and commercial buildings, agriculture and waste, together accounting for 55–60 per cent of the GHG emissions of the EU. The aim of the ESD is to decrease GHG emissions in the EU by 10 per cent below the 2005 level by 2020 and it includes binding annual targets for each member State for 2013–2020. Lithuania's target for non-ETS sectors is to limit its emission growth to 15 per cent above the 2005 level by 2020.

36. Lithuania introduced national-level policies to achieve its targets under the ESD and domestic emission reduction targets. The key policies reported are its NEIS, the National Renewable Energy Resources Development Strategy, the Strategy on Dwellings of the Republic of Lithuania, the law on energy from renewable sources and the Energy Efficiency Action Plan 2017–2019. In the energy sector, the mitigation actions with the highest estimated impact in 2020 are promoting energy efficiency in industry, which includes economic and information measures to promote the implementation of energy efficiency measures, and increasing the share of RES used by households, which is a

regulatory measure aimed at increasing the share of RES in heating by 80 per cent between 2013 and 2020. In the transport sector, duction of the final energy consumption in the transport sector is a regulatory measure t. t is expected to yield an emission reduction of 2,320 kt CO_2 eq by 2030. Of all the individual mitigation actions, the mitigation effect of biodegradable municipal waste handling is expected to be the most significant in 2020. Other policies that are expected to deliver significant emission reductions by 2020 are increasing the forest area and increasing the share of electricity generated from RES.

37. Lithuania highlighted the domestic mitigation actions that are under development, such as the revised NEIS in the energy sector, which will affect primary and final energy intensity. The Party reported in the PaMs sectoral tables mainly on the implemented mitigation actions. It reported one adopted mitigation action in the energy sector (recommendation on the main energy strategic directions for industry subsectors) and one in the IPPU sector (ratification of the Kigali Amendment to the Montreal Protocol), and one planned mitigation action in the transport sector (taxation for vehicles in Lithuania). Table 6 provides a summary of the reported information on the PaMs of Lithuania.

Table 6
Summary of information on policies and measures reported by Lithuania

Sector	*Key PaMs*	*Estimate of mitigation impact by 2020 (kt CO_2 eq)*	*Estimate of mitigation impact by 2030 (kt CO_2 eq)*
Policy framework and cross-sectoral measures	NEIS		
	National Renewable Energy Resources Development Strategy		
Energy			
Transport	Promotion of RES use in transport sector	423	
	Reduction of final energy consumption in transport sector		2 320
Renewable energy	Increasing the share of RES used by households	800	
	Increasing the share of electricity generated from RES	747	
Energy efficiency	Promotion of energy efficiency in industry	1 496	
	Renovation (modernization) of multi-apartment buildings	355	
IPPU	Best available technology use in cement production	500	
Agriculture	Implementation of the EU nitrates directive	100	
LULUCF	Increasing forest area	1 680	
Waste	Biodegradable municipal waste handling	1 940	

Note: The estimates of mitigation impact are estimates of emissions of CO_2 or CO_2 eq avoided in a given year as a result of the implementation of mitigation actions.

(b) Policies and measures in the energy sector

38. **Energy supply**. The objective of Lithuania's energy policy is to ensure security in supplying energy at competitive prices and with the lowest possible environmental impacts. The revised NEIS has the main goal of ensuring the energy independence of Lithuania by reducing electricity imports. The target is to produce domestically, in 2030, 70 per cent of electricity. To achieve this goal the Party implemented two projects for cogeneration plants with high efficiency based on biomass and waste. The plan is to use forest residues as well as softwood, with the potential being one billion cubic metres annually. The strategy sets the direction until 2050.

39. **Renewable energy sources**. Lithuania implements PaMs that aim to increase the share of electricity and district heating produced from RES and promote the use of RES in

industry and in households. The law on energy from renewable sources, adopted in 2011 and updated in 2015, established targets for 2020 for RES to account for 23 per cent of final energy consumption, 20 per cent of electricity consumption and at least 60 per cent of district heating production. In the transport sector the target is for RES to account for a 10 per cent share of total energy use. Some of these targets were overachieved before 2020: the share of RES in total final energy consumption was 25.5 per cent in 2016.

40. **Energy efficiency**. The Energy Efficiency Action Plan for 2017–2019 implements improvements in policies related to fuel taxation, public and residential building renovation, energy audits in industry, saving energy in companies or replacing boilers in households. Energy efficiency in Lithuania is expected to increase by 1.5 per cent each year until 2020. The Programme on Heat Industry Development in 2015–2021 (adopted in 2015) is expected to contribute to the development and modernization of the relevant industry, including technical solutions and the appropriate mix of fuels for thermal energy production. The programme also describes the demand and potential for higher-efficiency cogeneration, investments and relevant time frames.

41. **Residential and commercial sectors**. The programme on multi-apartment building renovation aims to reduce the use of thermal energy in the buildings that were built before 1993 by at least 20 per cent by the end of 2020. Their energy consumption is expected to be reduced by at least 1,000 GWh/year, corresponding to a GHG emission reduction of 230 kt CO_2 eq/year compared with the 2005 level. The public building renovation programme provides for the renovation of 700,000 m^2 by 2020 and is expected to reduce primary energy consumption by 60 GWh annually. In Lithuanian cities, approximately 72 per cent of residential space is heated via centralized heating systems. A reduction of 5 per cent in heat consumption for centralized heating is expected to be achieved by 2021 in comparison with the 2014 level as a result of efficiency improvements in public and multi-apartment buildings.

42. **Transport sector**. The National Programme on the Development of Transport and Communications for 2014–2022 has, among others, objectives to increase the mobility of goods and passengers, to improve the corridors of the EU Trans-European Transport Networks as well as their connections with national and local transport networks, to increase the energy efficiency of transport, to reduce the adverse impact of transport on the environment, and to improve the safety and security of traffic. It contains an analysis of the potential future development of road, rail, maritime, inland waterway and air transport. The programme also identifies the main goals for the development of infrastructure for alternative transport energy sources, including electricity. In the Lithuanian fleet, around 15,000 electric cars are anticipated by 2025, of which there are expected to be 6,000 in 2020. Lithuania also has in place strategic documents that consider longer time frames; for example, according to "Recommendations on Lithuania's main energy strategy directions", approved by Order No. 1-1314 of the Minister of Energy of the Republic of Lithuania in 2016, the energy intensity of transport shall be reduced by 2.4 times in comparison with the current level in the transport sector by 2050.

43. The NC7 includes information on how the Party promotes and implements the decisions of the International Civil Aviation Organization and the International Maritime Organization to limit emissions from aviation and marine bunker fuels.

44. **Industrial sector**. The Programme for Investment Incentives and Industry Development for 2014–2020 aims at more efficient use of energy and increased use of RES. The implementation of this programme is financed from the EU structural funds. According to "Recommendations on Lithuania's main energy strategy directions", the promotion of low energy intensive industry subsectors and the application of eco-innovative technologies are expected to save around 620 GWh of electricity consumption by 2025. Energy intensity in the industrial sector is expected to be reduced by 2.4 times compared with the current level by 2050.

(c) Policies and measures in other sectors

45. **Industrial processes**. Lithuania implements the control of volatile organic compound emissions resulting from the storage of petrol and its distribution from terminals

to service stations through a law adopted in 2000 and revised in 2016 implementing the EU legislation in this area. The Party also has in place a regulation to reduce the direct and indirect impact on the environment and the potential risk on human health of volatile organic compound emissions released by paints, solvents, adhesives and other products. The new EU F-gas regulation (517/2014) aims at cutting total EU emissions from F-gases by two thirds by 2030 compared with the 2014 level. It prohibits placing F-gases on the market in certain circumstances where alternatives are available. For 2018 to 2020, quotas for legally placing HFCs on the EU market were reduced to 63 per cent of the 2015 level. Lithuania implements the EU F-gas regulation through four domestic orders of the Minister of Environment. Lithuania also amended its Administrative Infringement Code in 2016 to establish more stringent responsibilities for breaching the requirements of handling F-gases.

46. **Agriculture**. The National Rural Development Programme promotes the growth of the agriculture sector based on technologies that are territorially and environmentally balanced, climate-friendly, resilient, competitive and innovative. It also promotes sustainable farming, crop rotation, rational use of synthetic fertilizers and their replacement by organic fertilizers. Since 2014 Lithuania has produced biogas from livestock holdings. Another important mitigation action is the protection of waters against nitrate pollution (such as implementation of the EU nitrates directive and its latest amendment (1137/2008)), which contributes to reducing N_2O emissions.

47. **LULUCF**. The National Forest Area Development Programme 2012–2020 aims to increase forest coverage to 34.2 per cent of the territory by 2020 through afforestation of abandoned lands and by providing financial incentives for forest regeneration. In the period of the Rural Development Programme 2007–2013, an area of 17,200 ha was afforested and 8,400 ha were afforested in the period 2014–2016. The Forest Law, amended in 2011, provides that changing forest land to any other land is allowed only in exceptional cases.

48. **Waste management**. The National Waste Management Plan for 2014–2020 has the objective to minimize GHG emissions in the waste sector. By 2020, the reuse and recycling of waste materials such as paper, metal, plastic and glass from households, and from other sources where waste streams are similar to those from households, shall be increased to a minimum of 50 per cent, by weight, of overall waste. Also, reuse, recycling and other material recovery shall be increased to a minimum of 70 per cent, by weight, of total waste. Lithuania has 54 waste collection areas for biodegradable waste. According to the plan adopted in 2017 on implementing the EU circular economy package, the amount of recycled, reclaimed or otherwise used municipal waste is targeted to be around 65 per cent of total waste in 2020.

(d) Minimization of adverse impacts in accordance with Article 2 and Article 3, paragraph 14, of the Kyoto Protocol

49. As part of the supplementary information under the Kyoto Protocol, in the NC7 Lithuania reported information on how it strives to implement PaMs under Article 2 of the Kyoto Protocol in such a way as to minimize adverse effects, including the adverse effects of climate change and effects on international trade and social, environmental and economic impacts on other Parties, especially developing country Parties. The Party reported in chapter 4.12 of its NC7 general information on how the EU seeks to minimize adverse effects on third parties in its policymaking processes. In chapter 7 of the NC7 (on financial resources and transfer of technology), the Party provided information on programmes that aim to minimize the adverse effects of climate change on developing countries.

50. Further information on how Lithuania strives to implement its commitments under Article 3, paragraph 14, of the Kyoto Protocol in such a way as to minimize adverse social, environmental and economic impacts on developing country Parties was reported in the 2017 annual submission. The Party reported on bilateral and multilateral development cooperation projects in the field of climate change according to the Law on Development Cooperation and Humanitarian Assistance (approved by the Parliament) and Directions for the Policy of Development Cooperation in 2014–2016 (approved by the Government). In its NIR and during the review the Party provided information on cooperation on the development of technologies and assisting developing country Parties that are highly

dependent on the export of fossil fuels in diversifying their economies. The NIR mentions a project for the construction of two solar power plants in Malaysia, recently finished, and, among the most recent developments, new projects selected for support by the Ministry of Environment concerning the construction of solar power plants and biomass boilers in the Republic of Moldova and solar power plants and heating systems in Georgia.

(e) Assessment of adherence to the reporting guidelines

51. The ERT assessed the information reported in the NC7 of Lithuania and identified issues relating to completeness, transparency and adherence to the UNFCCC reporting guidelines on NCs. The findings are described in table 7.

Table 7

Findings on policies and measures, including those in accordance with Article 2 of the Kyoto Protocol, from the review of the seventh national communication of Lithuania

No.	*Reporting requirement, issue type and assessment*	*Description of the finding with recommendation or encouragement*
1	Reporting requirement specified in paragraph 16 Issue type: completeness Assessment: encouragement	The Party did not provide, in its NC7, information on the identification of its own policies and practices that encourage activities that lead to greater levels of anthropogenic GHG emissions than would otherwise occur. In response to a question raised during the review, the Party explained that, as a member State of the EU, it has an obligation to carry out ambitious long-term actions to reduce GHG emissions until 2050. The long-term objective is to achieve a transformation towards a low-carbon economy at the EU level and among its member States. Progress towards achieving the targets is monitored and, in case of deviation, the existing sectoral policies are amended or new policies are introduced. These measures are transposed into the national legislation. Lithuania further explained that the decrease in GHG emissions, while the GDP is steadily growing, is considered to be proof of the effectiveness of the existing PaMs. The ERT reiterates the encouragement made in the previous review report that Lithuania report on the action taken to identify and periodically update its own policies and practices that encourage activities that lead to greater levels of anthropogenic GHG emissions than would otherwise occur, if any, and provide the rationale for such action.
2	Reporting requirement specified in paragraph 22 Issue type: transparency Assessment: recommendation	In the text of chapter 4.7.1 of the NC7, concerning PaMs in the energy sector, the Party reports two planned projects, namely the construction of cogeneration power plants in Vilnius and Kaunas, for which the specified period for implementation is 2017–2020. However, these projects are reported as "implemented" in the sectoral table 4-4 of the NC7. During the review, the Party explained that it applies the status definition of the PaMs provided in the UNFCCC reporting guidelines on NCs. In this respect the cogeneration power plants at Vilnius and Kaunas have the status "implemented" because the financing agreements for both plants have already been signed and the construction works of the new Vilnius cogeneration plant have already started. The Party agreed that more information could be presented on the status of the PaMs in the next NC. At the same time Lithuania explained that the circular economy package PaM is reported as "implemented" by mistake in table 4-11 of the NC7; instead it should be reported as "planned". The ERT recommends that Lithuania provide in the next NC correct and consistent information in the text and in the tables on the status of implementation of its PaMs.
3	Reporting requirement specified in paragraph 23 Issue type: transparency Assessment: encouragement	The Party reported in the NC7 estimations of mitigation impact for some PaMs and for some years (2015, 2020, 2030). However, the Party did not provide information concerning the quantitative mitigation impact for each sectoral PaM and year, including estimated changes in activity levels and/or emissions and removals due to adopted and implemented PaMs and a brief description of estimation methods. The Party also did not provide an explanation for the absence of this information. In response to a question from the ERT, the Party explained that the information in the NC7 concerning the quantitative mitigation impact for individual sectoral PaMs

No.	*Reporting requirement, issue type and assessment*	*Description of the finding with recommendation or encouragement*
		and years was provided to the extent possible. Lithuania further explained that, in most cases, the impact of the individual PaMs or collections of PaMs was taken from impacts defined in the national programmes, legal strategical documents and studies. For example, information on the impact of vehicle taxation was calculated in the study "Development of the criteria for determining the rates of vehicle circulation tax and formulation of recommendations for the taxation of vehicles in Lithuania"; the information on the mitigation impact of the policy to reduce water pollution and N_2O emissions was described in the Water Area Development Programme 2017–2023; and the mitigation impact of the policy to increase the forest area was taken from the National Forest Area Development Programme 2012–2020. The ERT encourages the Party to include, as appropriate, a quantitative estimate of the impacts of individual PaMs or collections of PaMs. Such information includes estimated changes in activity levels and/or emissions and removals due to adopted and implemented PaMs reported and a brief description of estimation methods. Alternatively, the ERT encourages the Party to provide an explanation for the absence of this information.

Note: Paragraph number listed under reporting requirement refers to the relevant paragraph of the UNFCCC reporting guidelines on NCs. The reporting on the requirements not included in this table is considered to be complete, transparent and adhering to the UNFCCC reporting guidelines on NCs.

C. Projections and the total effect of policies and measures, including information on supplementarity relating to the mechanisms pursuant to Articles 6, 12 and 17 of the Kyoto Protocol

1. Projections overview, methodology and results

(a) Technical assessment of the reported information

52. Lithuania reported updated projections for 2020 and 2030 relative to actual inventory data for 2014 under the WEM scenario. The WEM scenario reported by Lithuania includes implemented and adopted PaMs.

53. In addition to the WEM scenario, Lithuania reported the WAM scenario. The WAM scenario includes planned PaMs. The definitions of the scenarios correspond to those provided in the UNFCCC reporting guidelines on NCs, namely that WEM corresponds to implemented and adopted measures and WAM corresponds to planned measures.

54. The projections are presented on a sectoral basis, using the same sectoral categories as those used in the reporting on mitigation actions for 2015–2035. The WEM scenario is reported on a gas-by-gas basis for CO2, CH4, N2O, PFCs, HFCs and SF6 (treating PFCs and HFCs collectively in each case) as well as NF3 for 2020–2035 in the NC7, and the WAM scenario is provided by gas in CTF table 6. The projections are also provided in an aggregated format for each sector. During the review, the Party confirmed that global warming potential values were taken from the AR4.

55. Lithuania did not report emission projections for indirect GHGs such as carbon monoxide, nitrogen oxides, non-methane volatile organic compounds or sulfur oxides.

56. Emission projections related to fuel sold to ships and aircraft engaged in international transport were not reported separately and were not included in the totals in the NC7. Emission projections related to international aviation and navigation were reported separately in BR3 CTF tables 6(a) and 6(b). Lithuania reported on factors and activities affecting emissions for each sector.

(b) Methodology, assumptions and changes since the previous submission

57. The methodology used for the preparation of the projections is different from that used for the preparation of the emission projections for the NC6. The NC7 indicates that projections have been calculated according to "Methodological guidance for the preparation of national GHG emission projections", prepared in 2016 by the Lithuanian Energy

Institute. During the review, Lithuania reported supporting information explaining the methodologies and the changes made since the NC6:

(a) GHG emissions for the NC6 were estimated using the *Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories* and the IPCC *Good Practice Guidance and Uncertainty Management in National Greenhouse Gas Inventories*, while for the NC7 the *2006 IPCC Guidelines for National Greenhouse Gas Inventories* were used;

(b) The global warming potential values in the NC6 were taken from the Second Assessment Report of the Intergovernmental Panel on Climate Change, while in the NC7 they were taken from the AR4;

(c) A WOM scenario was not developed in the NC7, but it was presented in the NC6;

(d) A WAM scenario was presented in the NC6 for all sectors excluding LULUCF, while in the NC7 a WAM scenario was presented for the energy, waste and LULUCF sectors;

(e) The F-gas projections were calculated in the NC7, while constant emission values were used in the NC6. NF_3 projections were included in the NC7;

(f) New country-specific emission factors for fuels were used for projections in the NC7;

(g) The projection for population was obtained from Lithuanian institutions in the NC6, but it was taken from *EU Reference Scenario 2016* for the NC7;

(h) Road transport projections were prepared taking into consideration the linearly extrapolated number of road vehicles of different types in the NC7, while the NC6 used forecasts of activity data for road transport in five-year intervals prepared by the Ministry of Transport and Communications.

58. Key underlying assumptions for the projections, such as population growth, GDP growth and international fuel prices, were reported in CTF table 5. Lithuania did not provide information on some key underlying assumptions (e.g. population growth, tax levels and international fuel prices) in the NC7. During the review, Lithuania confirmed that the assumption on population growth was obtained from EU Reference Scenario 2016, and assumptions for GDP growth rate and international fuel prices were obtained from a Lithuanian energy sector development analysis published by the Lithuanian Energy Institute.

59. During the review, Lithuania also provided a comparison of the parameters used for the projections for the NC6 and NC7 for 2020.

60. The Party reported sensitivity analyses for the energy, agriculture and LULUCF sectors. Sensitivity analyses were conducted for a number of important assumptions, such as GDP and carbon price. During the review, the Party confirmed that sensitivity analyses of energy prices and population were not performed for the NC7.

(c) Results of projections

61. The projected emission levels under different scenarios and information on the Kyoto Protocol targets and the quantified economy-wide emission reduction target are presented in table 8 and the figure below.

Table 8
Summary of greenhouse gas emission projections for Lithuania

	GHG emissions (kt CO_2 eq per year)	*Changes in relation to base-year[a] level (%)*	*Changes in relation to 1990 level (%)*
Kyoto Protocol base year[b]	48 196.54	NA	0.3
Quantified emission limitation or reduction commitment under the Kyoto Protocol	14 200.10	NA	NA

	GHG emissions (kt CO_2 eq per year)	*Changes in relation to base-year[a] level (%)*	*Changes in relation to 1990 level (%)*
(2013–2020)[c]			
Quantified economy-wide emission reduction target under the Convention[d]	NA	NA	NA
Inventory data 1990[e]	48 040.58	NA	NA
Inventory data 2015[e]	20 096.21	–58.2	–58.2
WEM projections for 2020[f]	21 330.29	–55.6	–55.6
WAM projections for 2020[f]	18 874.84	–60.7	–60.7
WEM projections for 2030[f]	22 135.62	–53.9	–53.9
WAM projections for 2030[f]	17 944.58	–62.6	–62.6

[a] "Base year" in this column refers to the base year used for the target under the Kyoto Protocol, while for the target under the Convention it refers to the base year used for that target.

[b] The Kyoto Protocol base-year level of emissions is provided in the initial review report, contained in document FCCC/IRR/2016/LTU.

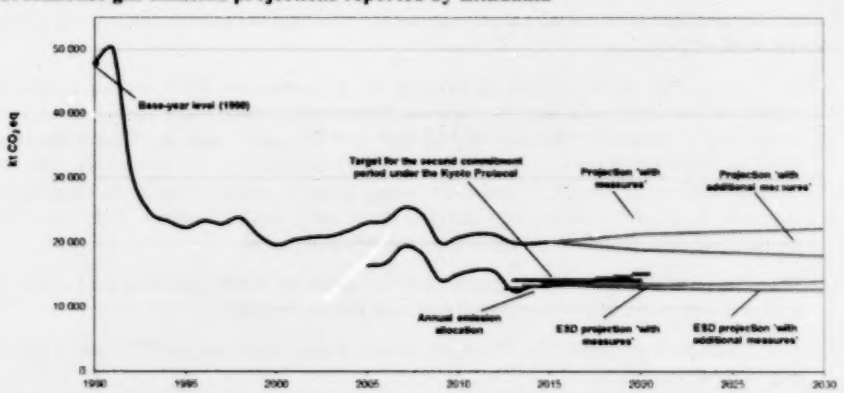
[c] The Kyoto Protocol target for the second commitment period (2013–2020) is a joint target of the EU and its 28 member States and Iceland. The target is to reduce emissions by 20 per cent compared with the base-year (1990) level by 2020. The target for non-ETS sectors is 15 per cent above 2005 levels for Lithuania under the ESD. The value presented in this line is based on annex II to European Commission decision 2013/162/EU and as adjusted by Commission implementing decision 2013/634/EU that established the assigned amount for the EU member States and divided by eight years to calculate the annual emission level.

[d] The quantified economy-wide emission reduction target under the Convention is a joint target of the EU and its 28 member States. The target is to reduce emissions by 20 per cent compared with the base-year (1990) level by 2020.

[e] From Lithuania's BR3 CTF table 6.

[f] From Lithuania's NC7 and/or BR3.

Greenhouse gas emission projections reported by Lithuania



Sources: (1) Data for the years 1990–2015: Lithuania's 2017 annual inventory submission, version 4; total GHG emissions excluding LULUCF; (2) data for the years 2020 and 2030: the Party's BR3 CTF tables 6(a) and 6(c); total GHG emissions excluding LULUCF; (3) data for historical ESD emissions 2005–2014 and projected ESD emissions 2015–2030 provided by the Party during the review.

62. Lithuania's total GHG emissions excluding LULUCF in 2020 and 2030 are projected to be 21,330.29 and 22,135.62 kt CO_2 eq, respectively, under the WEM scenario, which represents a decrease of 55.6 and 53.9 per cent, respectively, below the 1990 level. Under the WAM scenario, emissions in 2020 and 2030 are projected to be lower than those in 1990 by 60.7 and 62.6 per cent and amount to 18,874.84 and 17,944.58 kt CO_2 eq, respectively. The 2020 projections suggest that Lithuania will continue contributing to the achievement of the EU target under the Convention (see para. 32 above).

63. Lithuania's target for non-ETS sectors is to limit its emission growth to 15 per cent above the 2005 level by 2020 (see para. 35 above). Lithuania's AEA, which corresponds to its national emission target for non-ETS sectors, changes linearly from 12,936.66 kt CO_2 eq in 2013 to 15,240.06 kt CO_2 eq in 2020. According to the projections under the WEM scenario, emissions from non-ETS sectors are estimated to reach 13,571.56 kt CO_2 eq by 2020. Under the WAM scenario, Lithuania's emissions from non-ETS sectors in 2020 are projected to be 13,002.06 kt CO_2 eq. The projected level of emissions under the WEM and WAM scenarios are 10.9 and 14.7 per cent, respectively, below the AEA for 2020. The ERT noted that this suggests that Lithuania expects to meet its ESD target under the WEM scenario.

64. Lithuania presented the WEM and WAM scenarios by sector for 2020 and 2030, as summarized in table 9.

Table 9
Summary of greenhouse gas emission projections for Lithuania presented by sector

	GHG emissions and removals (kt CO_2 eq)					*Change (%)*			
		2020		*2030*		*1990–2020*		*1990–2030*	
Sector	*1990*	*WEM*	*WAM*	*WEM*	*WAM*	*WEM*	*WAM*	*WEM*	*WAM*
Energy (not including transport)	27 272.61	6 196.60	3 971.56	6 587.12	3 068.14	–77.3	–85.4	–75.8	–88.8
Transport	5 835.06	5 560.96	5 334.45	6 285.24	5 666.15	–4.7	–8.6	7.7	–2.9
Industry/industrial processes	4 502.71	3 945.26	3 945.26	3 742.89	3 742.89	–12.4	–12.4	–16.9	–16.9
Agriculture	8 853.48	4 989.38	4 989.38	5 093.04	5 093.04	–43.6	–43.6	–42.5	–42.5
LULUCF	–3 511.89	–7 954.16	–8 652.91	–7 988.96	–8 988.74	126.5	146.4	127.5	156.0
Waste	1 576.72	638.09	634.19	427.31	374.35	–59.5	–59.8	–72.9	–76.3
Total GHG emissions without LULUCF	**48 040.58**	**21 330.29**	**18 874.84**	**22 135.62**	**17 944.58**	**–55.6**	**–60.7**	**–53.9**	**–62.6**

Source: Lithuania's BR3 CTF table 6.

65. According to the projections reported for 2020 under the WEM scenario, the most significant emission reductions are expected to occur in the energy and agriculture sectors, amounting to projected reductions of 21,076.01 kt CO2 eq (77.3 per cent) and 3,864.10 kt CO2 eq (43.6 per cent) between 1990 and 2020, respectively. The pattern of projected emissions reported for 2030 under the same scenario remains the same. Significant increases in removals are also projected to occur for LULUCF between 1990 and 2020 (4,442.27 kt CO2 eq (126.5 per cent) under the WEM scenario).

66. If additional measures are considered (i.e. under the WAM scenario), the patterns of emission reductions by 2020 presented by sector remain the same.

67. Lithuania presented the WEM and WAM scenarios by gas for 2020 and 2030, as summarized in table 10.

Table 10
Summary of greenhouse gas emission projections for Lithuania presented by gas

	GHG emissions and removals (kt CO_2 eq)					*Change (%)*			
		2020		*2030*		*1990–2020*		*1990–2030*	
Gas	*1990*	*WEM*	*WAM*	*WEM*	*WAM*	*WEM*	*WAM*	*WEM*	*WAM*
CO_2	35 807.13	14 428.77	12 027.37	15 552.70	11 510.99	–59.7	–66.4	–56.6	–67.9
CH_4	6 953.76	2 908.46	2 876.91	2 774.45	2 661.81	–58.2	–58.6	–60.1	–61.7
N_2O	5 279.69	3 669.99	3 647.49	3 696.68	3 659.99	–30.5	–30.9	–30.0	–30.7
HFCs	NO	316.59	316.59	105.31	105.31	NA	NA	NA	NA
PFCs	NO	NO	NO	NO	NO	NA	NA	NA	NA

SF_6	NO	5.98	5.98	5.98	5.98	NA	NA	NA	NA
NF_3	NO	0.50	0.50	0.50	0.50	NA	NA	NA	NA
Total GHG emissions without LULUCF	**48 040.58**	**21 330.29**	**18 874.84**	**22 135.62**	**17 944.58**	**–55.6**	**–60.7**	**–53.9**	**–62.6**

Source: Lithuania's BR3 CTF table 6.

68. For projections under the WEM scenario presented by gas, for 1990 to 2020 the most significant reductions are projected for CO_2 and CH_4: 21,378.36 kt CO_2 eq (59.7 per cent) and 4,045.30 kt CO_2 eq (58.2 per cent), respectively.

69. The pattern of projected emissions reported for 2030 by gas under the WEM scenario remains the same.

70. If additional measures are considered (i.e. under the WAM scenario), the patterns of emission reductions by 2020 and 2030 presented by gas remain the same.

71. Lithuania reported in NC7 table 5-7 a comparison of the scenarios with those reported in the NC6. During the review, the Party explained that there were errors in table 5-7. Following corrected information being provided by Lithuania during the review, the ERT noted that, for example, projected emissions under the WEM scenario reported in the NC7 have decreased by 16.5 per cent when compared with the 2020 projections in the NC6. In addition to the summary of changes to the methodology and approach used for preparing projections since the NC6 (see para. 56 above), Lithuania provided, during the review, a comparison of the parameters used for the projections for the NC6 and NC7 for 2020. For example, in the NC7, the values for population and final energy consumption in the industry, residential and services sectors are assumed to be lower for 2020 compared with those parameters used for the projections in the NC6. GDP growth and final energy consumption in transport are higher in the NC7 scenarios compared with the NC6 scenarios for 2020.

(d) Assessment of adherence to the reporting guidelines

72. The ERT assessed the information reported in the NC7 of Lithuania and identified issues relating to transparency, completeness and adherence to the UNFCCC reporting guidelines on NCs. The findings are described in table 11.

Table 11

Findings on greenhouse gas emission projections reported in the seventh national communication of Lithuania

No.	*Reporting requirement, issue type and assessment*	*Description of the finding with recommendation or encouragement*
1	Reporting requirement specified in paragraph 28 Issue type: completeness Assessment: encouragement	The chapter in the NC7 on projections does not include a WOM scenario (see para. 57 above), although such a scenario was included in the NC6. During the review, Lithuania explained that a WOM scenario was not provided because its compilation would require human resources. The Party also stated that the value of the WOM scenario, as a backward-looking exercise, would be limited because it would not provide value in steering forward-looking policy decisions. The ERT encourages Lithuania to improve the completeness of its reporting by including a WOM scenario in its next NC or to provide a duly substantiated explanation as to why this information is not included in its NC.
2	Reporting requirement specified in paragraph 31 Issue type: transparency Assessment: recommendation	It is not clear in the NC7 projections chapter (e.g. section 5.1) what year is used as the starting point for the WEM and WAM scenarios. During the review, Lithuania confirmed that the starting point for all sectoral projections was 2014. The Party also confirmed that projected emissions for 2015 are provided in NC7 tables 5-1 and 5-2 and actual emissions for 2015 are provided in NC7 tables 5-6 and 5-7. The ERT recommends that Lithuania clearly indicate the year used as a starting point for its projections in the projections chapter of its next NC in order to enhance transparency.

No.	*Reporting requirement, issue type and assessment*	*Description of the finding with recommendation or encouragement*
3	Reporting requirement specified in paragraph 32 Issue: transparency Assessment: encouragement	According to paragraph 32 of the UNFCCC reporting guidelines on NCs, for the WEM and WAM projections, the starting point should generally be the latest year for which inventory data are available in the NC. The ERT considers that, as the NC7 was due 1 January 2018, the latest available inventory is that submitted in 2017 and consequently the latest available inventory year is 2015. In chapter 3 of the NC7, inventory data are provided for the period 1990–2015 in line with the 2017 annual submission, but 2014 is used as a starting point for the projections. During the review, Lithuania indicated that it did not use the latest available inventory year (2015) as the base year for the projections because the most recently reviewed GHG emission data (for 1990–2015) were not available until the end of September 2017. For the NC7 it used the projections submitted to the European Commission in March 2017 (updated after the EU internal review in May 2017) under EU regulation 525/2013, with 2014 as the starting point. The Party explained that it considered that the time frame was too short for updating the projections to use 2015 as the starting point. The ERT encourages Lithuania to use the latest inventory year for which inventory data are available as the starting point for scenarios in the NC in order to enhance transparency, or to provide a duly substantiated explanation of why this is not possible in its next NC.
4	Reporting requirement specified in paragraph 35 Issue type: completeness Assessment: encouragement	Projections of indirect GHGs are not provided in the NC7. During the review, the Party explained that it did not provide this information as it is not a mandatory requirement in the UNFCCC reporting guidelines on NCs. The ERT encourages Lithuania to improve the completeness of its reporting by including projections of indirect gases in its next NC.
5	Reporting requirement specified in paragraph 36 Issue type: completeness Assessment: recommendation	The ERT noted that projections related to fuel sold to ships and aircraft engaged in international transport are reported in CTF tables 6(a) and 6(b). Such projections are not provided separately in the NC7 and it is not clear whether the projections for the national total exclude emission projections related to fuel sold to ships and aircraft engaged in international transport. During the review, Lithuania confirmed that the totals presented in the NC7 exclude emission projections related to international transport. The ERT recommends that the Party report emission projections related to fuel sold to ships and aircraft engaged in international transport separately in its next NC, or, if such projections are presented in the BR, that the Party refer to its BR.
6	Reporting requirement specified in paragraph 42 Issue type: completeness Assessment: encouragement	The NC7 indicates that projections of GHG emissions have been calculated according to the "Methodological guidance for the preparation of national GHG emission projections", prepared in 2016 by the Lithuanian Energy Institute, and a reference to this methodological guidance is included in the NC7. However, there is insufficient information in the NC7 to enable the ERT to obtain a basic understanding of the models and/or approaches used for projecting GHG emissions and for estimating the total effects of PaMs on emissions and removals. During the review, Lithuania provided a summary of the models and approaches used for the projections. The ERT encourages Lithuania to improve the completeness of its reporting by including in its next NC summary information on the models and/or approaches used for projecting GHG emissions and for estimating the total effect of PaMs on emissions and removals.
7	Reporting requirement specified in paragraph 43 Issue type:	Lithuania's NC7 did not include for each model or approach used for projections information such as the gases/sectors considered, the type of model used (key characteristics, original purpose) and the model's strengths/weaknesses, as well as how it accounts for any overlap or synergies that may exist between different PaMs. In the NC7, the Party referred to the "Methodological guidance for the preparation of

No.	*Reporting requirement, issue type and assessment*	*Description of the finding with recommendation or encouragement*
	transparency	national GHG emission projections".
	Assessment: encouragement	During the review, Lithuania provided additional information on the models and approaches used. For example, it explained that the MESSAGE model was used for the energy sector. To increase transparency, the ERT encourages Lithuania to include in the next NC for each model and approach used for projections the following information: the gases/sectors considered, the type of model used (key characteristics, original purpose) and the model's strengths/weaknesses, as well as how it accounts for any overlap or synergies that may exist between different PaMs.
8	Reporting requirement specified in paragraph 45 Issue type: transparency Assessment: encouragement	In the NC7, Lithuania reported on the differences in the results of projections between the NC6 and NC7 (see para. 70 above). However, Lithuania did not report the main differences in the assumptions and methods employed between its NC6 and NC7. During the review, Lithuania provided information on the main differences in the projections between the NC6 and NC7 (see para. 56 above). The ERT encourages Lithuania to enhance the transparency of its reporting by including in its next NC the main differences in the assumptions and methods used between the projections in its current and previous NCs.
9	Reporting requirement specified in paragraph 47 Issue type: completeness Assessment: encouragement	Lithuania did not provide information on key underlying assumptions such as population growth, tax levels and international fuel prices in its NC7 using table 2. During the review, Lithuania indicated that information on population growth, GDP growth rate and international fuel prices is available in CTF table 5. The ERT reiterates the encouragement made in the previous review report that Lithuania enhance the completeness of its reporting by including in its next NC information about the key underlying assumptions and values of variables (e.g. population growth, international fuel prices) used for the projections, using table 2, or, if such information is provided in the BR, a reference to that information.

Note: Paragraph number listed under reporting requirement refers to the relevant paragraph of the UNFCCC reporting guidelines on NCs. The reporting on the requirements not included in this table is considered to be complete, transparent and adhering to the UNFCCC reporting guidelines on NCs.

2. Assessment of the total effect of policies and measures

(a) Technical assessment of the reported information

73. In the NC7 Lithuania did not present the estimated and expected total effect of implemented and adopted PaMs, in accordance with the WEM scenario, compared with a situation without such PaMs. The ERT noted that Lithuania presented the estimated and expected total effect of implemented and adopted PaMs and the total effect of planned PaMs in its NC6.

74. During the review, Lithuania provided information on the total effect of implemented and adopted PaMs (under the WEM scenario) and the total effect of planned PaMs (under the WAM scenario). The Party indicated that the mitigation impact was not estimated for all PaMs. Information provided during the review was presented in terms of GHG emissions (on a CO2 eq basis) in 2015, 2020 and 2030 under the WEM scenario and in 2020 and 2030 under the WAM scenario. Lithuania indicated that the total effect of PaMs leads to the achievement of Lithuania's energy efficiency, RES and GHG emission reduction targets in 2020.

75. During the review, Lithuania reported that the total estimated effect of its adopted and implemented PaMs in 2020 is 13,753 kt CO_2 eq including LULUCF and 9,193 kt CO_2 eq excluding LULUCF. According to the information provided during the review, PaMs implemented in the LULUCF sector will deliver the largest emission reductions, followed by PaMs implemented in the energy and waste sectors. Table 12 provides an overview of the total effect of PaMs as provided by Lithuania during the review. The ERT notes that the

summary information provided on the total effect of implemented and adopted PaMs, for example, is not consistent with the total sum of the estimated impacts of PaMs provided in BR3 CTF table 3.

Table 12
Projected effects of Lithuania's planned, implemented and adopted policies and measures by 2020 and 2030

	2020		*2030*	
Sector	*Effect of implemented and adopted measures (kt CO_2 eq)*	*Effect of planned measures (kt CO_2 eq)*	*Effect of implemented and adopted measures (kt CO_2 eq)*	*Effect of planned measures (kt CO_2 eq)*
Energy (without transport)	4 065			
Transport	846	160	2 320	960
Industrial processes	500			
Agriculture	113			
Land-use change and forestry	4 560			
Waste management	3 669	74		260
Total	**13 753**	**234**	**2 320**	**1 220**

Source: Information on aggregated impact of individual PaMs provided by Lithuania during the review.

(b) Assessment of adherence to the reporting guidelines

76. The ERT assessed the information reported in the NC7 of Lithuania and identified issues relating to completeness and adherence to the UNFCCC reporting guidelines on NCs. The findings are described in table 13.

Table 13
Findings on the assessment of the total effect of policies and measures from the review of the seventh national communication of Lithuania

No.	*Reporting requirement, issue type and assessment*	*Description of the finding with recommendation or encouragement*
1	Reporting requirement specified in paragraph 39	In its NC7, Lithuania did not present the estimated and expected total effect of implemented and adopted PaMs.
	Issue type: completeness	During the review, Lithuania provided information on the total effect of implemented and adopted PaMs (under the WEM scenario). The Party indicated that the mitigation impact was not estimated for all PaMs.
	Assessment: recommendation	The ERT recommends that Lithuania improve the completeness of its reporting by including in the next NC the estimated and expected total effect of implemented and adopted PaMs.
2	Reporting requirement specified in paragraph 39	In its NC7, Lithuania did not present the total expected effect of planned PaMs.
	Issue type: completeness	During the review, Lithuania provided information on the total effect of planned PaMs (under the WAM scenario). The Party indicated that the mitigation impact was not estimated for all PaMs.
	Assessment: encouragement	The ERT encourages Lithuania to improve the completeness of its reporting by including in the next NC the expected total effect of planned PaMs.
3	Reporting requirement specified in paragraph 40	Lithuania did not present in its NC7 an estimate of the total effect of its PaMs in terms of GHG emissions avoided or sequestered, by gas (on a CO_2 eq basis).
	Issue type: completeness	During the review, Lithuania explained that the total effect of PaMs by gas will be evaluated for the next NC.
	Assessment: recommendation	The ERT reiterates the recommendation made in the previous review report that Lithuania report the total effect of PaMs, in accordance with the WEM definition, compared with a situation without such PaMs, by gas (on a CO_2 eq basis), in its next NC.

Note: Paragraph number listed under reporting requirement refers to the relevant paragraph of the UNFCCC reporting guidelines on NCs. The reporting on the requirements not included in this table is considered to be complete, transparent and adhering to the UNFCCC reporting guidelines on NCs.

3. Supplementarity relating to the mechanisms pursuant to Articles 6, 12 and 17 of the Kyoto Protocol

(a) Technical assessment of the reported information

77. In the NC7 Lithuania provided information on how its use of the mechanisms under Articles 6, 12 and 17 of the Kyoto Protocol is supplemental to domestic action, although it did not elaborate on supplementarity as such. The ERT noted that Lithuania does not plan to use the market-based mechanisms to meet its Kyoto Protocol target.

78. For the second commitment period under the Kyoto Protocol, two joint implementation projects are being implemented regarding N_2O emission reduction in chemical industry. Chapter 5 of the NC7 does not include any reference to clean development mechanism activities or to the use of certified emission reduction units by Lithuanian companies that take part in the EU ETS. During the review, the Party explained that Lithuania has not yet participated in any activity at the national level. However, some of the companies participating in the EU ETS have purchased certified emission reduction units for the purpose of compliance with their individual targets.

(b) Assessment of adherence to the reporting guidelines

79. The ERT assessed the information reported in the NC7 of Lithuania and recognized that the reporting is complete and transparent. No issues relating to the topics discussed in this chapter of the review report were raised during the review.

D. Provision of financial and technological support to developing country Parties, including information under Articles 10 and 11 of the Kyoto Protocol

80. Lithuania is not an Annex II Party and is therefore not obliged to adopt measures and fulfil obligations defined in Article 4, paragraphs 3, 4 and 5, of the Convention. However, Lithuania provided information in the NC7 on its provision of support to developing country Parties. The ERT commends Lithuania for reporting this information and suggests that it continue to do so in future NCs.

81. In its NC7, Lithuania provided information on financial resources related to the implementation of the Convention through bilateral, regional and multilateral channels from 2011 to 2017. The multilateral support was provided through the World Bank for the Energy Sector Management Assistance Programme (in 2011 and 2012), the European Bank for Reconstruction and Development for the Eastern Europe Energy Efficiency and Environmental Partnership Fund (in 2011), the European Investment Bank for the Eastern Partnership Technical Assistance Trust Fund (in 2014, 2015 and 2016) and the Green Climate Fund (in 2015). The bilateral and regional support was provided to Armenia, Georgia, Malaysia and the Republic of Moldova. Examples of projects financed by Lithuania include the construction of two solar power plants in Malaysia; the construction of solar power plants and installation of biomass boilers for residential heating in kindergartens, schools and a health centre in the Republic of Moldova; and the construction of solar power plants in schools and kindergartens in Georgia.

82. Lithuania also provided information on its capacity-building activities, including waste management system improvement in Serbia and the project Strengthening Sustainable Management of Forests in Georgia.

E. Vulnerability assessment, climate change impacts and adaptation measures

1. Technical assessment of the reported information

83. In its NC7 Lithuania provided the required information on the expected impacts of climate change in the country; the adaptation policies covering regional, sectoral and cross-sectoral vulnerabilities and considerations; and an outline of the action taken to implement Article 4, paragraph 1(b) and (e), of the Convention with regard to adaptation. Lithuania provided a description of climate change vulnerability and impacts in relation to agriculture and food, forestry, water resources, fisheries, energy, transport infrastructure, construction and the building sector, biodiversity, health, social impacts, the economy and the private sector, and highlighted the adaptation response actions taken and planned at different levels of government.

84. Impetus has been given to addressing adaptation matters by the adoption of the Strategy for National Climate Change Management Policy for 2013–2050, which provides further direction to government agencies on enhancing preparedness for climate change. Projections research was carried out at the Hydrology and Climatology Department of Vilnius University, based on the climate projection RCP8.5 scenario, which represents the highest changes. That research found that the average annual temperature in Lithuania could increase by almost 6 °C. Under the RCP2.6 scenario the 2 °C threshold in Lithuania would be exceeded in the first half of the twenty-first century but thereafter the average temperature would not change considerably. In short, it is expected that global temperature will increase by 2 °C compared with the pre-industrial level in the middle of the twenty-first century, and in Lithuania about 15–20 years earlier. By 2035 the average annual precipitation is expected to increase by 1.6–4.0 per cent. Even more significant changes in precipitation are projected in the late twenty-first century, when average annual precipitation may increase by 3.7–13.5 per cent. During the twenty-first century in Lithuania daily air temperature fluctuations are expected to increase and the number of hot days (>30 °C) and warm nights (>15 and >18 °C) is expected to increase as well. Thus, it is possible that heatwaves will increase in frequency and intensity (they will last longer and will reach higher air temperatures). The number of extremely cold days is expected to decrease more slowly. The Party reports in its NC7 that, based on the results of previous studies in Lithuania, the Baltic Sea coastal region is most vulnerable to climate change. The coast, coastal ecosystems and local population are likely to be affected by sea level rise, storm and hurricane winds, sea and Curonian Lagoon water warming and salinity changes.

85. According to Lithuania's NC7, the changing climate, with rising temperatures, increases in extreme weather events (storms, floods, windfalls) and rising river levels, is expected to have an impact on all sectors of society. The Party reports that both adverse and beneficial impacts caused by climate change are expected, but, in order to minimize the risks caused by climate change, the Party needs to plan and implement adaptation measures. Table 14 summarizes the information on vulnerability and adaptation to climate change presented in the NC7 of Lithuania.

Table 14

Summary of information on vulnerability and adaptation to climate change reported by Lithuania

Vulnerable areas	*Examples comments adaptation measures reported*
Agriculture	*Vulnerability*: Adverse impacts on productivity and production in the agriculture and livestock sectors owing to extreme weather events (heatwaves, storms and floods) and soil erosion; increase in the number of insects, fires and spread of diseases; decrease in soil fertility. *Adaptation*: Environmentally friendly farming practices including breeding more resistant livestock and planting more resistant crops; establishing warning and information systems for fires and extreme weather events; increasing the capacities of observation networks; insuring against potential damage.
Biodiversity and natural ecosystems	*Vulnerability*: High risk of bushfires owing to extreme weather events; eutrophication; emergence of invasive alien species; change of species habitat; land degradation; sea level rise; warming of lakes and rivers.

Vulnerable area	*Examples comments adaptation measures reported*
	Adaptation: Protective or recovery actions; environmental management plans and biological diversity protection programmes; planting of local native species; controlling pests.
Coastal zones	*Vulnerability*: Coastal erosion caused by an increase in storm frequency; frequent floods in coastal region owing to sea level rise and winter storms; adverse impacts on fish resources owing to water mineralization (Curonian Lagoon).
	Adaptation: Coastal foredunes ridge; coastal protection measures implementation programme; nature management plan of coastal dunes.
Energy	*Vulnerability*: Supply disruptions owing to extreme weather events; increase in electricity demands for cooling because of higher summer temperatures; damage to electric power lines caused by cold winters.
	Adaptation: Ensuring sufficient energy reserves; management and technical measures; technological and structural measures; training and education; innovation and research.
Fisheries	*Vulnerability*: Decrease in fish stocks (Baltic Sea); degradation in water quality; rise in water temperature; changes in fish distribution; deterioration of diadromous fish migration; increase in number of invasive species; disappearance of local species.
	Adaptation: Reduction of eutrophication; ensuring the migration of diadromous fish; scientific research; public education and information; Programme of the Lithuanian Fisheries Sector 2014–2020.
Forests	*Vulnerability*: Increase in forest fires; high risk for young forests owing to an increase in extreme events (floods and heatwaves); increase in the number of insects; increase in defoliation of trees; changes in forest productivity.
	Adaptation: Sustainable forestry policy; forest planting in unused land or land not suitable for agriculture; forest fire management; reforestation; insurance against potential damage; research.
Human health	*Vulnerability*: Adverse impacts owing to higher frequency of extreme weather events such as heatwaves and extreme cold; new invasive insect species.
	Adaptation: National Public Health and Heat Prevention Action Plan for 2016–2020; improved awareness about risks of climate change; public warning systems.
Infrastructure and economy including tourism and transport	*Vulnerability*: Adverse impacts on tourism owing to insect-spread diseases; changes in tourism destinations and seasonal tourism owing to increases in temperature; rail buckling caused by rising temperatures and extended heatwave periods; delays, interruptions and needs for detouring because of extreme weather events.
	Adaptation: Preparation of technical regulations for building bridges or roads (flood-prone territories); climate-resilient transport infrastructure; insurance against potential damage.
Water resources	*Vulnerability*: Risk to the quantity and quality of water resources and public drinking water supply; eutrophication; increasing number of floods; deterioration to ground and surface water bodies.
	Adaptation: Flood risk management; National Water Area Development Programme 2017–2023; drainage system optimization; Climate Change Mitigation and Adaptation Guidelines for Municipalities 2017.

86. Lithuania provided a description of international adaptation activities, including cooperation with Norway to strengthen the capacity of municipalities in Lithuania to adapt to climate change and with other countries in the Baltic region, for example in the context of the preparation of the Baltic Sea Region Climate Change Adaptation Strategy and Action Plan. In its NC7 (the chapter on financial resources and transfer of technology), Lithuania provided information on bilateral cooperation with developing countries in adaptation, in particular with the former Yugoslav Republic of Macedonia on water management and with Georgia on sustainable forest management, and on funding provided to multilateral funds such as the Eastern Partnership Technical Assistance Trust Fund administered by the European Investment Bank and the Green Climate Fund, which is used for various climate-related projects including adaptation. The ERT noted that a cross reference to these sections in the chapter on vulnerability and adaptation would further improve the transparency of reporting within the NC.

2. Assessment of adherence to the reporting guidelines

87. The ERT assessed the information reported in the NC7 of Lithuania and recognized that the reporting is complete, transparent and adhering to the UNFCCC reporting guidelines on NCs. No issues relating to the topics discussed in this chapter of the review report were raised during the review.

F. Research and systematic observation

1. Technical assessment of the reported information

88. Lithuania provided information on its general policy and funding relating to research and systematic observation and both domestic and international activities, including contributions to the World Climate Programme and the GCOS. Lithuania also provided information on the identification of opportunities for and barriers to free and open international exchange of data and information and on action taken to overcome such barriers.

89. Lithuania has implemented and planned international and domestic policies and programmes on climate change research, systematic observation and climate modelling. In 2015, the Lithuanian Government approved a programme on the implementation of the research, development and innovation priority areas (the Smart Specialization Programme) and action plans for the implementation of the priorities. The overall aim of this programme is to develop policy instruments that would include both the cross-cutting and subject measures necessary to achieve a substantial breakthrough in the six priority fields that Lithuania has identified as its main areas for research, development and innovation. One of the priority areas of the Smart Specialization Programme is energy and sustainable environment, which has close links to climate change. The main priorities of the energy and sustainable environment priority area are the following: smart systems for energy efficiency, diagnostic, monitoring, metering and management of generators, grids and customers; energy and fuel production using biomass/waste and waste treatment, storage and disposal; technology for the development and use of smart low-energy buildings – digital construction; and solar energy installations and technologies for using these for power generation, heating and cooling. In its NC7, Lithuania reported on a large number of research institutes and universities that carry out research on climate change impacts, adaptation and mitigation, such as marine and inland water management and protection, climate change in peatlands, energy sector development research, modelling of long-term GHG emission reduction strategies, use of RES, assessment of geothermal energy resources, sustainable forestry and global changes, resistance of plants to drought and cold, and sustainable animal production systems. Lithuanian scientific institutions are also actively involved in research activities in support of the national GHG inventory and projections development.

90. In terms of activities related to systematic observation, Lithuania reported on national plans, programmes and support for ground- and space-based climate observing systems, including satellite and non-satellite climate observation. The Party explained that the Lithuanian Hydrometeorological Service performs climate observations, analyses climate changes, provides information and actively participates in the activities of Eastern and Central European working groups. The Vilnius meteorological station is included in the GCOS Surface Network and thus provides a contribution to the surface-based atmospheric essential climate variables. The Party also explained in its NC7 that significant planning is being undertaken to ensure appropriate correlation between Lithuanian and international needs and data that are collected. Furthermore, the Lithuanian Hydrometeorological Service has bilateral agreements with various institutions (e.g. in Belarus (i.e. Ministry of Natural Resources and Environmental Protection), the Russian Federation (i.e. Federal Service of Hydrometeorology and Environmental Monitoring) and Poland), which facilitates the improvement of quality and expedition of information provided by all sides.

91. Regarding research and systematic observation related to capacity-building in developing countries, Lithuania refers in its NC7 (chapter 8.3) to the support provided for capacity-building projects, including those covering adaptation, implemented in developing

countries. In addition, Lithuania explained in its NC7, referring to a recommendation made in the previous review report, that because of the limited financial and human resources at the Lithuanian Hydrometeorological Service, there are currently no plans to initiate capacity-building activities in developing countries to establish and maintain observing systems.

2. Assessment of adherence to the reporting guidelines

92. The ERT assessed the information reported in the NC7 of Lithuania and recognized that the reporting is complete, transparent and adhering to the UNFCCC reporting guidelines on NCs. No issues relating to the topics discussed in this chapter of the review report were raised during the review.

G. Education, training and public awareness

1. Technical assessment of the reported information

93. In the NC7 Lithuania provided information on its actions relating to education, training and public awareness at the domestic and international level. The Party provided information on the general policy on education; training and public awareness; primary, secondary and higher education; public information campaigns; training programmes; education materials; resource or information centres; the involvement of the public and NGOs; and its participation in international activities.

94. According to the NC7, the Ministry of Education is responsible for the coordination of education. The Education Act, the Vocational Education and Training Act and the Higher Education Act are the relevant legislative provisions, along with the relevant laws. Lithuanian scientific institutions offer education and higher education studies that cover various aspects of climate change. Schoolchildren and students have a lot of possibilities to broaden their knowledge of sustainable development, analysis of ecosystems' sensitivity, management of resources, environmental impact assessment, adapting to climate change, and modelling and forecasting of climate change. Climate change education is also offered through public awareness campaigns and projects organized by different organizations. Communication about climate change is performed by different ministries, each within the sphere of their own responsibilities and tasks. In its NC7 Lithuania reported that the Lithuanian population and Government are increasingly paying attention to the issue of climate change, and the topic is growing in popularity in public debates and in the press. A lot of work has also been performed at the local level – 14 municipalities have joined the Covenant of Mayors (see para. 31 above). Guidance for the municipalities on mitigation and adaptation to climate change was developed in October 2017.

95. Lithuania also reported in its NC7 on several education cooperation projects that raise awareness of climate change, such as capacity-building and institutional cooperation between beneficiary State and Norwegian public institutions, local and regional authorities between Lithuania and Norway; ECO-Life – sustainable zero-carbon eco town developments improving quality of life across the EU, supported by the Seventh Framework Programme; and the Let's Make Our Cities Greener project. NGOs are extensively involved in the development of climate change policy in Lithuania. NGOs also organize events related to climate change, participate in the development of national and international legislation and prepare publications about climate change. For example, the Lithuanian Fund for Nature, which is an NGO for the conservation of nature, is involved in awareness-raising. Lithuania also reported on campaigns targeted at citizens, such as Earth Hour, European Mobility Week and the European Week for Waste Reduction.

2. Assessment of adherence to the reporting guidelines

96. The ERT assessed the information reported in the NC7 of Lithuania and identified an issue relating to completeness. The finding is described in table 15.

Table 15
Findings on education, training and public awareness from the review of the seventh national communication of Lithuania

No.	*Reporting requirement, issue type and assessment*	*Description of the finding with recommendation or encouragement*
1	Reporting requirement specified in paragraph 65 Issue type: completeness Assessment: encouragement	In the NC7, Lithuania did not report the extent of public participation in the preparation or domestic review of the NC. In response to a question raised by the ERT during the review, the Party reported that there was no special invitation to the public to participate in the preparation of the NC, but the draft NC7 was sent for comments to the National Climate Change Committee, which consists of representatives of government, academia, industry and NGOs. The ERT encourages the Party to improve the completeness of the information provided in its NC by reporting on the extent of public participation in the preparation or domestic review of the NC, for instance by including the information provided during the review.

Note: Paragraph number listed under reporting requirement refers to the relevant paragraph of the UNFCCC reporting guidelines on NCs. The reporting on the requirements not included in this table is considered to be complete, transparent and adhering to the UNFCCC reporting guidelines on NCs.

III. Conclusions and recommendations

97. The ERT conducted a technical review of the information reported in the NC7 of Lithuania in accordance with the UNFCCC reporting guidelines on NCs. The ERT concludes that the reported information mostly adheres to the UNFCCC reporting guidelines on NCs and that the NC7 provides an overview of the national climate policy of Lithuania.

98. The information provided in the NC7 includes all elements of the supplementary information under Article 7 of the Kyoto Protocol. Supplementary information under Article 7, paragraph 1, of the Kyoto Protocol on the minimization of adverse impacts in accordance with Article 3, paragraph 14, of the Kyoto Protocol was provided by Lithuania in its 2017 annual submission.

99. Lithuania's total GHG emissions excluding LULUCF covered by its quantified economy-wide emission reduction target were estimated to be 58.2 per cent below its 1990 level, whereas total GHG emissions including LULUCF were 69.9 per cent below the 1990 level, in 2015. Emission decreases were driven by the transition to a market-based economy by restructuring manufacturing industries, energy industries and agriculture. There have been significant changes in the use of oil products influenced by a decrease in the consumption of heavy fuel oil for electricity production and district heat and the growth of consumption of fuel in the transport sector. Although the energy profile significantly changed during this period, there has been an overall increase in emissions from transport since 2000, which is influenced by the increased density of transport routes and the number of road vehicles.

100. Lithuania's main policy framework relating to energy and climate change is the implementation of the EU 2020 climate and energy package. The key legislation, plans and programmes supporting Lithuania's climate change goals are: NEIS, the Energy Efficiency Action Plan, the National Renewable Energy Resources Programme for 2016–2020, the National Programme for Transport and Communications, the EU regulation on F-gases, the Rural Development Programme 2014–2020, the National Water Area Development Programme 2017–2023, the National Forest Area Development Programme 2012–2020 and the National Waste Management Plan for 2014–2020. The most significant mitigation impacts stem from actions that aim at promoting the use of RES in households, electricity generation and transport or improving energy efficiency in industry, transport and multi-apartment buildings. Measures in agriculture (e.g. implementation of the EU nitrates directive), forestry (e.g. increase of the forest area by afforestation) and waste (e.g.

management of biodegradable municipal waste) sectors will also contribute to emission reductions by 2020.

101. The GHG emission projections provided by Lithuania include those under the WEM and WAM scenarios. In the two scenarios, emissions are projected to be 55.6 per cent and 60.7 per cent below the 1990 level in 2020, respectively. Lithuania's target for non-ETS sectors is to limit its emission growth to 15 per cent above the 2005 level by 2020. Lithuania's AEA, which corresponds to its national emission target for non-ETS sectors, is 15,240.06 kt CO_2 eq for 2020. The projected emission levels for non-ETS sectors under the WEM and WAM scenarios are 10.9 and 14.7 per cent, respectively, below the AEA for 2020. On the basis of the reported information, the ERT concludes that Lithuania expects to meet its target for non-ETS sectors.

102. For the second commitment period of the Kyoto Protocol, from 2013 to 2020, Lithuania committed to contributing to the joint EU economy-wide quantified emission reduction target to reduce GHG emissions by 20 per cent compared with the base-year level by 2020. Lithuania's national target by 2020 for sectors outside the EU ETS is 15 per cent above the 2005 base-year level. Lithuania reported projections for non-ETS sectors that indicate that the Party is on course to meet its 2020 target.

103. The NC7 contains information on how the Party's use of the mechanisms under Articles 6, 12 and 17 of the Kyoto Protocol is supplemental to domestic action. Lithuania is not planning to make use of the Kyoto Protocol mechanisms to meet its Kyoto Protocol target.

104. Lithuania is not an Annex II Party and is therefore not obliged to adopt measures and fulfil obligations defined in Article 4, paragraphs 3, 4 and 5, of the Convention. However, Lithuania provided information in the NC7 on its provision of support to developing country Parties.

105. Lithuania reported in its NC7 that the changing climate, with rising temperatures, increasing occurrence of extreme weather events and rising river levels, is expected to have an impact on all sectors of the society. The Strategy for National Climate Change Management Policy guides both mitigation and adaptation actions in Lithuania. The Baltic Sea coastal region is most vulnerable to climate change: the coast, coastal ecosystems and local population are likely to be affected by sea level rise, storm and hurricane winds, sea and Curonian Lagoon water warming and salinity changes. In order to adapt to climate change, Lithuania cooperates with other countries in the Baltic region, for example in the context of the preparation of the Baltic Sea Region Climate Change Adaptation Strategy and Action Plan.

106. Regarding research and systematic observation, in 2015 the Lithuanian Government approved a programme on the implementation of the research, development and innovation priority areas (the Smart Specialization Programme) and action plans for the implementation of the priorities, including energy and sustainable environment. A large number of research institutes and universities carry out research on climate change impacts, adaptation and mitigation, such as marine and inland water management and protection, climate change in peatlands, assessment of geothermal energy resources and sustainable forestry. The Lithuanian Hydrometeorological Service performs climate observations and analyses climate changes. The Vilnius meteorological station is included in the GCOS Surface Network and thus provides a contribution to the surface-based atmospheric essential climate variables.

107. Lithuanian scientific institutions offer education and higher education studies that cover various aspects of climate change. Climate change education is also offered through public awareness campaigns and projects organized by different organizations. Communication about climate change is performed by different ministries, each within the sphere of their own responsibilities and tasks. NGOs are extensively involved in the development of climate change policy in Lithuania, including participation in the development of national and international legislation.

108. In the course of the review, the ERT formulated the following recommendations for Lithuania to improve its adherence to the UNFCCC reporting guidelines on NCs and its reporting of supplementary information under the Kyoto Protocol:[3]

(a) To improve the completeness of its reporting by:

(i) Reporting emission projections related to fuel sold to ships and aircraft engaged in international transport separately, or, if such projections are presented in the BR, by referring to its BR (see issue 5 in table 11);

(ii) Including in the next NC the estimated and expected total effect of implemented and adopted PaMs (see issue 1 in table 13);

(iii) Including the total effect of PaMs, in accordance with the WEM definition, compared with a situation without such PaMs, by gas (on a CO_2 eq basis) (see issue 3 in table 13);

(b) To improve the transparency of its reporting by:

(i) Including information on the existing provisions to make information on the legislative arrangements and enforcement and the administrative procedures established pursuant to the implementation of the Kyoto Protocol publicly accessible (see issue 1 in table 5);

(ii) Providing correct and consistent information in the text and in the tables on the status of implementation of its PaMs (see issue 2 in table 7);

(iii) Clearly indicating the year used as a starting point for its projections in the projections chapter of its next NC (see issue 2 in table 11).

IV. Questions of implementation

109. During the review, the ERT assessed the NC7, including the supplementary information provided under Article 7, paragraph 2, of the Kyoto Protocol, and reviewed the information on the minimization of adverse impacts in accordance with Article 3, paragraph 14, of the Kyoto Protocol with regard to timeliness, completeness, transparency and adherence to the UNFCCC reporting guidelines on NCs. No question of implementation was raised by the ERT during the review.

[3] The recommendations are given in full in the relevant sections of this report.

Annex

Documents and information used during the review

A. Reference documents

2017 GHG inventory submission of Lithuania. Available at http://unfccc.int/national_reports/annex_i_ghg_inventories/national_inventories_submissions/items/10116.php.

BR3 of Lithuania. Available at http://unfccc.int/national_reports/biennial_reports_and_iar/biennial_reports_data_interface/items/10132.php.

BR3 CTF tables of Lithuania. Available at http://unfccc.int/national_reports/biennial_reports_and_iar/biennial_reports_data_interface/items/10132.php.

"Guidelines for the preparation of national communications by Parties included in Annex I to the Convention, Part II: UNFCCC reporting guidelines on national communications". FCCC/CP/1999/7. Available at http://unfccc.int/resource/docs/cop5/07.pdf.

"Guidelines for the preparation of the information required under Article 7 of the Kyoto Protocol". Annex to decision 15/CMP.1. Available at http://unfccc.int/resource/docs/2005/cmp1/eng/08a02.pdf.

"Guidelines for the preparation of the information required under Article 7 of the Kyoto Protocol". Annex III to decision 3/CMP.11. Available at http://unfccc.int/resource/docs/2015/cmp11/eng/08a01.pdf.

"Guidelines for review under Article 8 of the Kyoto Protocol". Annex to decision 22/CMP.1. Available at http://unfccc.int/resource/docs/2005/cmp1/eng/08a03.pdf.

"Guidelines for the technical review of information reported under the Convention related to greenhouse gas inventories, biennial reports and national communications by Parties included in Annex I to the Convention". Annex to decision 13/CP.20. Available at http://unfccc.int/resource/docs/2014/cop20/eng/10a03.pdf.

NC7 of Lithuania. Available at http://unfccc.int/national_reports/annex_i_natcom/submitted_natcom/items/10138.php.

Report on the individual review of the annual submission of Lithuania submitted in 2016. FCCC/ARR/2016/LTU. Available at http://unfccc.int/resource/docs/2017/arr/ltu.pdf.

Report on the review of the report to facilitate the calculation of the assigned amount for the second commitment period of the Kyoto Protocol of Lithuania. FCCC/IRR/2016/LTU. Available at http://unfccc.int/resource/docs/2017/irr/ltu.pdf.

Report on the technical review of the sixth national communication of Lithuania. FCCC/IDR.6/LTU. Available at http://unfccc.int/resource/docs/2014/idr/ltu06.pdf.

Revisions to the guidelines for review under Article 8 of the Kyoto Protocol. Annex I to decision 4/CMP.11. Available at http://unfccc.int/resource/docs/2015/cmp11/eng/08a01.pdf.

B. Additional information provided by the Party

Responses to questions during the review were received from Ms. Jolanta Merkeliene (Ministry of Environment), including additional material. The following documents[1] were provided by Lithuania:

BGI Consulting, UAB. 2015. *Services for the Development of the Criteria for Determining the Rates of Vehicle Circulation Tax, based on the Experience of Other Countries and Statistical Data and Formulation of Recommendations for the Taxation of Vehicles in Lithuania, with Justificatio of the Recommended Rates and Expected Outcomes. Summary.* Vilnius.

Lithuanian Energy Institute, Laboratory of Energy Systems Research. *Methodological Guidance for the Preparation of National Greenhouse Gas Emission Projections.*

National Energy Independence Strategy. Unofficial translation from Lithuanian to English.

Seimas of the Republic of Lithuania. 2012. *Resolution Approving the National Strategy for Climate Change Management Policy 6 November 2012, No XI-2375.* Vilnius.

[1] Reproduced as received from the Party.